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ABSTRACT

A study examined the differences between the processes involved in analytic and summary writing by contrasting student writing of both kinds. Twenty 11th graders, 10 high and 10 average ability writers, participated in two composing-aloud sessions. In one session, the student wrote an analytic essay about a history passage and, in the other session, a summary of a different history passage. Think-aloud protocols were divided into individual communication units, each of which was analyzed for seven categories representing underlying features of the writing process. In analytic writing, students used a more varied and complex set of thinking operations than when writing summaries, for which they mainly restated pieces of content from the reading, with little interpretation of content. Overall, results indicate that, where critical thinking skills are concerned, the nature of the writing task makes a significant difference, and that the act of writing can serve as a powerful heuristic--a tool for thinking critically about subject matter. (Author/EL)

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Cognitive and Linguistic Demands of Analytic Writing

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ABSTRACT

To investigate cognitive and linguistic strategies involved in analytic writing, organized around generalization and supporting detail, the study contrasted high school students' analytic and summary essay writing. Twenty eleventh graders, ten high and ten average ability writers, each participated in two composing-aloud sessions. In one session, the student wrote an analytic essay about a history reading passage and in the other, a summary of a different history passage. Think-aloud protocols were divided into individual communication units, each of which was analyzed for seven categories, representing underlying features of the writing process. Essays were examined for the genre conventions governing students' analytic and summary text structures. Multivariate analysis of variance techniques were used to explore results of the protocol and essay analyses. In analytic writing, students employed a more varied and complex set of thinking operations than when writing summaries. In summary writing, students mainly restated pieces of content from the reading, and did little interpreting of content. Overall, results indicate that, where critical thinking skills are concerned, the kind of writing task makes a significant difference. Findings suggest that the act of writing can serve as a powerful heuristic--a tool for critical thinking about subject matter.

Introduction

The study which I'm going to discuss focuses on the problems students have, and the processes they employ, in analytic writing. But before I tell you about my research, let me say exactly what I mean by analytic writing, and why I think it's a subject worth investigating.

There are many different kinds of writing that could be called analytic, but I'm looking at one that's very common in schooling: the analytic essay. This type of writing is organized around a set of critical issues, rather than having a chronological or descriptive organization. In analytic writing, the writer goes beyond a retelling of events to a more focused interpretation of those events, using a pattern of generalization and supporting detail to explain a point of view.

In high schools, which my research centers on, the most common type of analytic writing is probably the thesis/support essay. Students are typically asked to take a stand on some issue, and to defend their position. I have an example of such an essay assignment from the teacher whose students I did my research on. This is Figure 1 in your handout, from an 11th grade American History class.

As you can see, the assignment is heavily structured, and it reveals the classic "5 paragraph theme" format. The first paragraph contains the thesis and background information, the 3 interior paragraphs provide evidence supporting the thesis, and the final paragraph is a kind of mirror-image conclusion.

Figure 1

Example of Analytic, Thesis/Support Essay

Eleventh grade American History -- "Write a 5 paragraph 4-500 word essay in ink on every other line one side only with a corrected rough draft attached. Use your pamphlet to answer the following question:

American overseas expansion was/was not justified because _____, _____, and _____. This three part thesis statement is to appear in the first paragraph, the introduction or background. Underline your thesis statement.

The second, third and fourth paragraphs are to take the three reasons supporting your thesis and provide the proof or supportive evidence. You must use facts to back up and prove your opinion. Each of these body paragraphs is to have a topic sentence and the first two will also have transition sentences.

The fifth paragraph will be the conclusion, summarizing the main ideas you present and drawing the essay to a close.

So that, in a nutshell, is your garden-variety, analytic essay. But why did I decide to study it? Well for me, the most practical reason is that students often have a great deal of trouble with such writing. For instance, the National Assessment of Educational Progress (1981), in a study of students across the country, found that, while students were generally fairly proficient at writing summaries of reading passages, their writing often broke down when they were asked to present and defend their own interpretations or analyses of passage content.

Writing researchers, such as Arthur Applebee (1981, 1984) and James Britton (1975), argue that the reason students have so much trouble writing analytically is because analytic writing places a very difficult set of cognitive and linguistic demands upon the writer. They see chronological summary, relying as it does on familiar narrative frameworks, as a less complex task than analytic writing, which involves a shift to a hierarchical structure of logically connected assertations and evidence. So, the kinds of thinking processes that students employ in analytic and summary writing seem to be quite different. But there has been very little work on trying to find out what the actual differences are. It was with these issues in mind that I put together my study. I'd like to say a little now about what the study involved, what analyses I employed, and what I found.

Procedures

The purpose of the study was to gain a better understanding of the demands of analytic writing. I decided the best way to do

this would be to contrast analytic writing with some other form of writing. Chronological summary seemed like a good contrast because, as research has shown, analysis and summary are two of the most common types of secondary school writing activities.

To examine students' writing processes, I had them write analyses and summaries of material presented in history reading passages. First, I found an American History teacher known within his department for using writing activities, and asked him to recommend 20 eleventh grade students for the study, 10 high and 10 average ability student writers, based on his overall appraisal of their writing.

Each student participated in 2 individual writing sessions. In one session, the student wrote a summary of a history passage and in the other an analytic essay about a different passage. Both readings had a narrative structure. One was on the Great Depression, while the other was on the McCarthy Era. There were 2 writing topics for each passage, a summary and an analysis, from which students were assigned one. The topics they wrote about are listed in Figure 2. To avoid sequencing effects, the order in which students read the 2 passages and wrote either summaries or analyses about them was counterbalanced. To externalize students' writing processes, I had them compose out loud, having trained them beforehand in the composing aloud procedure. Then, because not all writing processes are revealed in think aloud protocols, I asked them to stop writing after 35 minutes to answer questions about their writing processes. These retrospective discussions and the think aloud protocols were

Figure 2

Writing Prompts

The Great Depression: Analysis

Write an essay on the following topic: Explain what you think is the main economic lesson to be learned from the events discussed in the reading passage "The Great Depression."

Be certain to defend your points with specific evidence and examples from the passage.

Summary

Write an essay on the following topic: In your own words, summarize the events discussed in the reading passage "The Great Depression."

Questions of Loyalty: Analysis

Write an essay on the following topic: Explain what you think is the main political lesson to be learned from the events discussed in the reading passage "Questions of Loyalty."

Be certain to defend your points with specific evidence and examples from the passage.

Summary

Write an essay on the following topic: In your own words, summarize the events discussed in the reading passage "Questions of Loyalty."

tape-recorded and transcribed for later analysis. I'd like to talk now about one of the analyses I employed.

Analyses

Thisis a coding system,based on Judith Langer's work (in press), for the composing aloud transcripts. It's a system that divides the protocol into individual communication units, each consisting of a main clause and its subordinate clauses. Each communication unit was analyzed for 7 categories, representing underlying features of the writing process. I have 40 protocols, with an average of about 150 communication units per protocol, which gives me a total of around 6000 communication units. Each one was analyzed 7 times, so that's 42,000 separate analyses. I'd like to focus on the first main category, cognitive operations, and its set of sub-categories.

If you look at Figure 3, you'll see the individual sub-categories for cognitive operations. Each communication unit was coded as belonging to one of these sub-categories. Let's go over them briefly. They represent the range of thinking processes the students engaged in as they wrote. Lower level questions are mainly content oriented, where students ask questions about material that could be directly retrieved from the reading, as in the examples. Higher level questions require more inference on the part of students, and concern some aspect of content not directly stated in the reading, or focus on the writing process itself, or on the structure of the writer's developing text. Lower level plans are fairly simple, and focus on what's going to be said next. They're "shaped at the point of utterance."

Figure 3

COGNITIVE OPERATIONS -- The types of thinking students engaged in as they wrote.

1. Lower Level Questioning - Uncertainties the writer expresses concerning ideas or information directly retrievable or easily deduced from the reading passage.

> "When did Hoover become president?" "What was his first name?" "Where does it say about overproduction?"

2. Higher Level Questioning - Expressing lack of understanding about aspects of the writing task itself or about points not directly stated in the reading passage.

> "I'm trying to think what lesson is to be learned from this." "Wonder if I should brainstorm some more ideas for my thesis." "Should I put a transition between these two points?"

3. Lower Level Planning - Local plans on what will be written that center around what the writer intends to say next, "shaped at the point of utterance."

> "I'm going to write about atomic secrets next."
> "It talks about the Cold War, so I'll write about the Cold War."

4. Higher Level Planning - More global or abstract plans focusing on the writing process, written text structure, or the need for connections between unrelated ideas and events from the reading.

> "I want to show how bank failing relates to the entire topic." "I've gotta come up with a good outline."

5. Restating Content - Repeating what is in the reading passage or written text.

> "Hoover tried to help business." "The Cold War began after WW2."

6. Constructing Meaning - Forming new ideas or relations among ideas from concepts and information in the reading.

> "The passage shows that, in financial matters, one must always plan for the future." "Overproduction is a good example of the not planning."

7. Evaluating - Judging the appropriateness of the written product and the writer's own behaviors.

> "Wait, my thesis doesn't make any sense!"
> "This writing's terrible."
> "It's not a political lesson, but a societal lesson."

Higher level plans, on the other hand, are more global and abstract, as in the examples. Restatements are communication units that repeat or closely paraphrase passage content, indicating no real synthesis or analysis of the information. Constructions of new meaning take place when students go beyond the information given in the reading, say by forming a generalization based on passage content, making an inference concerning some point alluded to but not well developed in the reading, or finding some larger patterns or trends. Finally, evaluations are statements in which students assess the effectiveness or appropriateness of the content or language of their essays. Two raters analyzed students' protocols for cognitive operations and the other six categories. Interrater agreement in coding a sub-sample of 120 communication units for cognitive operations was .91.

Because the protocols varied in length, I calculated the percent of comments in each category for each protocol, thus controlling for number of communication units per protocol. I ran multivariate analyses of variance on all the categories, with ability as a between subjects factor and writing task as a within subjects factor, and when I found significance at the .10 level in the multivariate analysis, then I also ran univariate analyses on the individual sub-categories.

Results

This analysis was intended to distinguish between the processes involved in analytic and summary writing, and to highlight the particular processes students employ in analytic

writing. And if you look at Table 1, you'll see that there were considerable differences between analytic and summary writing. This table presents means and statistical results for the analysis of students' cognitive operations.

The results indicate a highly significant difference between the cognitive operations involved in analytic and summary writing. Looking at the univariate analyses, we can see that 6 of the 7 sub-categories showed large differences. Students did more than twice as much higher level questioning in analytic writing as in summary. They did much more higher level planning, almost 4 times as much constructing of new meaning, and more evaluating of their ideas and language in analysis. In contrast, when they wrote summaries, students did much more direct restating of content from their reading passages, and more lower level planning and questioning.

These findings suggest that when students wrote analytically, they employed a more varied and complex set of cognitive operations than when engaged in writing summaries. These contrasting patterns are illustrated in Figure 4, which contains excerpts from the analytic and summary protocols of Marina, a high ability student writer. The first example is from near the end of her analysis on the Great Depression reading, where she is going over her paper to make sure she adequately supported her thesis, which concerned the economic lesson to be learned from the events leading up to the Depression. The second is from late in her summary of the passage on the McCarthy Era. The left side of the page lists her communication units, while the right side lists the cognitive operations she employed.

Table 1

Cognitive Operations

		Mean Percent						
	(n)	Lower Level Ques.	Higher Level Ques.	Lower Level Plans	Higher Level Plans	Re-sta-ting	Con-struc-tion	Eval-ua-tions
Analysis								
High	$\bar{X}$ (10)	8.2	10.6	1.5	13.0	33.5	18.6	14.4
	SD	4.8	6.8	1.8	6.6	13.7	13.6	6.9
Aver.	$\bar{X}$ (10)	7.6	7.2	5.1	7.3	57.6	6.4	8.8
	SD	4.6	5.6	3.6	9.0	21.7	6.1	5.6
Total Analy	$\bar{X}$ (20)	7.9	8.9	3.3	10.2	45.6	12.5	11.6
	SD	4.6	6.3	3.3	8.2	21.5	12.0	6.7
Summary								
High	$\bar{X}$ (10)	9.9	5.5	6.4	7.2	54.4	5.4	11.1
	SD	5.6	4.7	4.1	4.4	12.7	5.1	7.6
Aver.	$\bar{X}$ (10)	9.6	2.8	7.2	5.2	66.8	1.0	7.4
	SD	5.3	2.9	6.7	5.6	22.1	1.9	6.0
Total Summ.	$\bar{X}$ (20)	9.7	4.1	6.8	6.2	60.6	3.2	9.3
	SD	5.3	4.0	5.5	5.0	18.7	4.4	6.9
Total								
	$\bar{X}$ (40)	8.8	6.5	5.0	8.2	53.1	7.9	10.4
	SD	5.0	5.8	4.8	7.0	21.3	10.1	6.8

Significant Multivariate Effect

Writing Task: $F[7,8] = 10.6$, $p < .002$

Univariate Effects

Lower Level Questioning:	$F[1,14] = 0.76$, $p < .398$
Higher Level Questioning:	$F[1,14] = 20.11$, $p < .001$
Lower Level Planning:	$F[1,14] = 19.70$, $p < .001$
Higher Level Planning:	$F[1,14] = 11.21$, $p < .005$
Constructing New Meaning:	$F[1,14] = 30.76$, $p < .001$
Restating Content:	$F[1,14] = 26.87$, $p < .001$
Evaluating:	$F[1,14] = 3.19$, $p < .096$

Figure 4

Marina's Analysis

Communication Units	Operations
Lesson, lesson, gotta get back to lessons!	Higher Level Plan
Trying to think how to put lessons back in the paper.	Higher Level Question
Okay, buying on margins, this one's all right.	Evaluation
I'm checking over my paragraphs to make sure I put a lesson in.	Evaluation
People lost tremendous amounts of money.	Restatement
The banking system failed, causing even more people to lose their life savings.	Restatement
Yeah, this showed that banking systems had to have a way of being insured.	Constructing New Meaning

Marina's Summary

Communication Units	Operations
China became communist, instilling more fear of communist expansion.	Restatement
Uh, the McCarren-Walter Act was proposed and passed by Truman.	Restatement
Wait, by Congress, not Truman.	Restatement
It stated, it regulated foreign subversives out of the U.S.	Restatement
God, the writing's terrible!	Evaluation
Uh, McCarthyism developed...	Restatement
What was his first name?	Lower Level Question

As we see in the above examples, Marina engages in richer and more complex thinking operations while writing analytically than while summarizing. In her summary excerpt, restating of content direct from the reading is punctuated only by a rather anguished, but resigned, lament about her writing style, and a simple question about a first name. In her analysis, however, we see a range of complicated questions, plans, and evaluations, culminating in the construction of a generalization that arises directly out of the material she has been wrestling with. On the whole, the cognitive operations she employed in analytic writing seem far more sophisticated than those evident in her summary.

Implications

So what do these results mean? Well, they show that, where critical thinking skills are concerned, the kind of writing task really does make a difference. Here, the analytic prompt pushed students to construct their own interpretations of the reading. As educators, we like to think we encourage students to do the kinds of critical thinking activities we have seen illustrated in these analytic protocols, such as planning, asking inferential questions, and generally going beyond the information given in making sense of subject matter. But research on secondary school writing (Applebee, 1981, 1984) suggests that, too often, even when students are asked to write analytic pieces, the actual analysis comes directly from the teacher's lectures or from assigned readings. That is, students' analyses are often summaries of somebody else's analyses. So, it is questionable how much actual analyzing students have to do for these tasks.

My point is, if we really want to foster in students the use of such higher level thinking processes, then we need to encourage writing tasks in which we let students do their own analyzing. We must not continue to undermine the power of writing to act as a heuristic--a tool for critical thinking.

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